

## **REMARKS**

Claims 1-3, 5, 11-12 and 15 are amended and new claims 28-29 are added. No new matter is being presented.

### **35 U.S.C. § 102 Rejection of Claims 15-18 and 22**

Claims 15-18 and 22 are rejected under 35 U.S.C. § 102(b) as being anticipated by EP 1170387 to Soyama (hereinafter “Soyama”). The Office Action indicates that Soyama discloses an apparatus with a vessel (3), nozzle (4), pressure/flow control valve (6) upstream of the nozzle and a steel sample plate (W). The steel sample plate (W) of Soyama is equated to Applicants’ claimed baffle plate.

With respect to Soyama, element “W” referenced in the Office Action is actually a “Workpiece.” According to Soyama, “[h]igh-pressure water is injected from Nozzle 4 to generate Cavitation 9 around the jet so to hit the cavitation bubbles **against Workpiece W.**” (Soyama, ¶ [0050], emphasis added). Impact from the cavitation is used to **treat** the Workpiece W. Thus, Soyama fails to disclose or suggest a baffle plate that is positioned upstream from the nozzle to regulate the flow from the nozzle to a vessel outlet as claimed.

As Soyama fails to disclose or suggest each element as claimed by Applicants in independent claim 15, Applicants respectfully request withdrawal of the rejection of independent claim 15. Regarding claims 16-18 and 22, Applicants assert that Soyama fails to disclose or suggest each element as claimed by Applicant in independent claim 15, from which claims 16-18 and 22 depend. Accordingly, Applicants respectfully request withdrawal of the rejection of dependent claims 16-18 and 22 for the same reasons.

**35 U.S.C. § 103 Rejection of Claims 1-4, 6-7, 11-14 and 24-27**

Claims 1-4, 6-7, 11-14 and 24-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,834,982 to Solonitsyn et al. (hereinafter “Solonitsyn”), in view of Soviet patent document SU 720085 to Pilipenko et al. (hereinafter “Pilipenko”), as evidenced by Smook.

The Office Action indicates that Solonitsyn discloses “a method for treating pulp using cavitation which delaminates and fiberates fibers using a fluid jet.” (Action, p. 8). Additionally, Solonitsyn is cited for disclosing bubbles generated by cavitation that contact the pulp suspension to strip contaminants.

The claims are presently narrowed to recite bubbles being formed by a liquid jet. Nowhere is this disclosed by the cited references. Specifically, Solonitsyn discloses air being introduced through its nozzle (see Example 15). Even beyond this, Solonitsyn requires bubbles being generated by a non-streamlined cylindrical solid body transversely in an elongated passageway in the hydrodynamic flow of the suspension and clearly dissuades one skilled in the art from using cavitation generated by any other method. For example, Solonitsyn states, “[t]hese methods [liquid treatment] and devices, however, are inapplicable for treating suspensions of fibrous materials, since cavitation forces arising in such hydrodynamic flow are of low intensity.” (Col. 6, lines 32-34).

In contrast, Applicants’ method as recited in independent claims 1 and 11 utilizes bubbles generated by cavitation using a liquid jet to contact the surfaces of fibers and strip contaminants. These fine bubbles have a diameter of approximately 1μm to 1mm. The bubbles are brought into contact with the pulp suspension to strip substances deposited on the pulp fiber surfaces. Accordingly, Solonitsyn neither discloses nor suggests the use of a liquid jet to generate cavitation and the rejection of claims 1 and 11 should be withdrawn.

Pilipenko and Smook do not disclose use of a liquid jet and thus fail to cure the basic deficiencies of Solonitsyn. Independent claims 1 and 5 are believed to be patentably distinct over Solonitsyn, Pilipenko and Smook either alone or in combination. With respect to dependent claims 2-5, 7, 12-14 and 25-27, such claims are ultimately dependent on independent claims 1 and 11, respectively, and are patentably distinct for the same reasons.

### **35 U.S.C. § 103 Rejection of Claim 8**

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Solonitsyn, in view of Pilipenko and further in view of U.S. Patent No. 7,264,182 to Richter et al. (hereinafter “Richter”). However, claim 8 is ultimately dependent on independent claim 1 and is patentably distinct as Solonitsyn, Pilipenko and Richter do not disclose use of bubbles applied externally to fibers that are generated by cavitation using a liquid jet.

### **35 U.S.C. § 103 Rejection of Claims 5 and 15-24**

Claims 5 and 15-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Solonitsyn, in view of Pilipenko and Smook. However, claim 5 is ultimately dependent on independent claim 1 and is patentably distinct as Solonitsyn, Pilipenko and Smook do not disclose use of bubbles applied externally to fibers that are generated by cavitation using a liquid jet.

With respect to claims 15-24, the Office Action states that Solonitsyn discloses an apparatus that includes a recirculation tank, an effuser, a reactor, a pump and nozzles for introducing a chemical reagent to a suspension flow, where the nozzles are formed by 2 plates (referring to Solonitsyn, Fig. 2). These plates are equated to Applicants’ claimed baffle plate. It is noted that the Office Action provides the claim construction of a plate to be

“A smooth, flat, relatively thing, rigid body of uniform thickness,” and concludes that a cylindrical object cannot be considered a plate. (Action, pg. 5).

Referring to Fig. 2 of Solonitsyn, the elements detailed in the Office Action to be “plates” are in fact pipes leading to the nozzles 15. The arrows seen in Fig. 2 show the direction of flow of material through those very pipes to the nozzles 15. The pipes are not “flat” as necessary to fit within the claim construction of a “plate” as provided in the Office Action.

Thus, independent claim 15 is believed to be patentably distinct over Solonitsyn, Pilipenko and Smook either alone or in combination. With respect to dependent claims 16-24, such are ultimately dependent on independent claim 15 and are patentably distinct for the same reasons as those claims.

Prompt and favorable examination on the merits is solicited.

Respectfully submitted,

/Rajiv S. Shah/  
Rajiv S. Shah  
Reg. No. 56,247

Roylance, Abrams, Berdo & Goodman, L.L.P.  
1300 19th Street, N.W., Suite 600  
Washington, DC 20036  
(202)659-9076

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